(P 233) Investigation the Influence of Ar Plasma Treatment on Cell Response for Wet-Spun Starch/Polycaprolactone Fiber Mesh Scaffolds

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In design of a tissue engineering scaffold, surface physicochemistry is one of the most important issues to be considered. The physicochemical properties of the surface directly influence the scaffold performance by affecting the cellular response and ultimately effecting the new tissue formation. In order to improve the cell affinity, the surface hydrophiliticy, surface energy, surface roughness and surface charge can be modify by different methods. Plasma treatment is a versatile method for surface treatment of biodegradable polymers without altering their bulk properties. By this method, it is possible to introduce or graft desired functional groups onto the surface. This study aims to investigate the influence of Ar plasma treatment on osteablast cell response for fiber mesh scaffolds from a starch-polycaprolactone blend. The scaffolds with 77% porosity were successfully produced by a wet spinning technique. The fiber surfaces were then treated by plasma at 30W for 15 min using Argon as a working gas. It was observed that the surface morphology and chemical composition were significantly changed due to the etching and functionalization of the fiber surfaces. XPS analyses showed an increase of the oxygen content of the fiber surfaces after plasma treatment (untreated scaffolds O/C:0.26 and plasma treated scaffolds O/C:0.32). Both untreated and treated scaffolds were examined using human osteoblast-like cells (SaOs-2) during 2 weeks of culture. The cell seeded on wet-spun SPCL fiber mesh scaffolds showed high viability and alkaline phosphatase enzyme activity. Those values were found to be even higher for the cells seeded on the plasma treated scaffolds.